

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently Amended) A manufacturing apparatus for manufacturing an intermediate product, the apparatus comprising:

a plurality of process modules each performing a plurality of processes; and an inter-process carrying means for carrying a container between the plurality of process modules, the container being capable of storing a plurality of intermediate products therein, and the inter-process carrying means including at least one of an automatic carrying robot and an automatic carrying vehicle;

a plurality of loaders, each loader being capable of acquiring the container from the inter-process carrying means, removing the intermediate products stored in the container, and transferring the intermediate products to one of the process modules in a single product state;

wherein each process module includes:

an intra-process carrying conveyor arranged radially from the inter-process carrying means for carrying the intermediate products within the process module in the single product state in a carrying direction, the intra-process carrying conveyor having a first side, which carries the intermediate products away from the inter-process carrying means, connected to a second side, which carries the intermediate products towards the inter-process carrying means; and

a plurality of processing means for performing the plurality of processes, respectively, within each process module, each processing means having a robot for acquiring and returning the intermediate products to the intra-process carrying means, and a mini-buffer for temporarily storing the intermediate products;

wherein the plurality of processing means are arranged along the first side and the second side of the intra-process carrying conveyor at locations corresponding to an order of processes to be performed on the intermediate products, and arranged along the second side of the intra-process carrying conveyor at locations corresponding to the order of processes to be performed on the intermediate products, without arranging a plurality of processing means for performing the same kinds of processes on the intermediate products in a group, wherein a sequence of the locations of the plurality of processing means along the first and second sides of the intra-process carrying conveyor corresponds to a sequence of the order of processes to be performed on the intermediate products by the plurality of processing means;

wherein a the series of processes to be performed on the intermediate products is completed during a single circulation of the intermediate products on the intra-process conveyor along the first side and the second side of the intra-process carrying conveyor by first performing processes, according to the sequence of the order of processes, with the processing means arranged along the first side and, after performing the processes with the processing means arranged along the first side, then performing processes, according to the sequence of the order of processes, with the plurality of processing means arranged along the second side; and

wherein, after completion of the series of processes, the intermediate products are loaded into the container and returned to the inter-process carrying means.

2. (Previously Presented) The manufacturing apparatus according to Claim 1, wherein the loader has a buffering function of temporarily storing the intermediate products to be transferred therein.

3. (Previously Presented) The manufacturing apparatus according to Claim 1, wherein the inter-process carrying means is adapted to carry a container before the maximum number of intermediate products capable of being stored in the container is reached, and the loader selects the plurality of intermediate products to be processed in the same next process module, stores the selected intermediate products in the container in a group, and transfers the container to the inter-process carrying means.

4. (Original) The manufacturing apparatus according to Claim 1, wherein the intermediate products comprise plate-shaped members.

5. (Original) The manufacturing apparatus according to Claim 4, wherein the intermediate products comprise semiconductor wafers.

6. (Original) The manufacturing apparatus according to Claim 4, wherein the intermediate products comprise substrates for liquid crystal display devices.

7. (Currently Amended) A manufacturing method of manufacturing an intermediate product via process modules, each performing a plurality of processes, the method comprising:

an inter-process carrying step of carrying a container between the process modules with inter-process carrying means that include at least one of an automatic carrying robot and an automatic carrying vehicle, the container being capable of storing a plurality of intermediate products therein;

a loading step of acquiring the container, removing the intermediate products stored in the container, and transferring the intermediate products to one of the process modules in a single product state;

an intra-process carrying step of carrying the intermediate products within each process module on an intra-process conveyor in the single product state in a carrying direction, the intra-process conveyor being arranged radially from the inter-process carrying means and having a first side, which carries the intermediate products away from the inter-process carrying means, connected to a second side, which carries the intermediate products towards the inter-process carrying carrying means; and

a processing step of performing the plurality of processes by a plurality of processing means, respectively, in each process module,

wherein the plurality of processing means are arranged along the first side and the second side of the intra-process conveyor at locations corresponding to an order of processes to be performed on the intermediate products, and arranged along the second side of the intra-process carrying conveyor at locations corresponding to the order of processes to be performed on the intermediate products, without arranging the plurality of processing means for performing the same kinds of processes on the intermediate products in a group, wherein a sequence of the locations of the plurality of processing means along the first and second sides of the intra-process carrying conveyor corresponds to a sequence of the order of processes to be performed on the intermediate products by the plurality of processing means, wherein a the series of processes to be performed on the intermediate products is completed during a single circulation of the intermediate products on the intra-process conveyor during the intra-process carrying step by first performing processes, according to the sequence of the order of processes, with the processing means arranged along the first side and, after performing the processes with the processing means arranged along the first side, then performing processes, according to the sequence of the order of processes, with the plurality of processing means arranged along the second side, and wherein, after

completion of the series of processes, the intermediate products are loaded into the container and carried to another process module.

8. (Cancelled)